

SEQUENCE LISTING

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TECH CENTER 1600/2900

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<120> BIOENGINEERED VEHICLES FOR TARGETED NUCLEIC ACID DELIVERY

<130> 23611-A USA

<140> As yet unassigned

<141> 2001-06-25

<150> 60/213,653

<151> 2000-06-23

<160> 53

<170> PatentIn Ver. 3.1

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<211> 18

<212> PRT

<213> Homo sapiens

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Arg Thr Leu
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<212> PRT

<213> Murine sarcoma virus

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<212> PRT

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<211> 21
<212> PRT
<213> Homo sapiens
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<212> PRT
<213> Simian virus 40
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<212> PRT
<213> Homo sapiens
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<220>

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:Human/murine

chimeric single chain binding polypeptide (C6.5 sFv)

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1 5 10 15

Ser Leu Lys Ile Ser Cys Lys Gly Ser Gly Tyr Ser Phe Thr Ser Tyr
20 25 30

Trp Ile Ala Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Tyr Met
35 40 45

Gly Leu Ile Tyr Pro Gly Asp Ser Asp Thr Lys Tyr Ser Pro Ser Phe
50 55 60

Gln Gly Gln Val Thr Ile Ser Val Asp Lys Ser Val Ser Thr Ala Tyr 65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Pro Ser Asp Ser Ala Val Tyr Phe Cys
85 90 95

Ala Arg His Asp Val Gly Tyr Cys Ser Ser Ser Asn Cys Ala Lys Trp

100 105 110

Pro Glu Tyr Phe Gln His Trp Gly Gln Gly Thr Leu Val Thr Val Ser 115 120 125

Ser Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Ser 130 135 140

Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Ala Ala Pro Gly Gln 145 150 155 160

Lys Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Asn Asn 165 170 175

Tyr Val Ser Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu 180 185 190



Ile Tyr Gly His Thr Asn Arg Pro Ala Gly Val Pro Asp Arg Phe Ser 200 205 195 Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Phe Arg 220 215 210 Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser Leu 230 235 240 225 Ser Gly Trp Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly 245 250 255

<210> 35

<211> 765

<212> DNA

<213> Artificial Sequence

<220>

<400> 35

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ceegggaaaag geetggagta catggggete atetateetg gtgaetetga caccaaatac 180
agecegteet teeaaggeea ggteaceate teagtegaea agteegteag cactgeetae 240
ttgeaatgga geagtetgaa geeteggae aagtgeetga atttttgtge gagaeatgae 300
gtgggatatt geagtagtte caaetgegea aagtggeetg atttttgtge gagaeatgae 360
cagggeacee tggteacegt eteeteaggt ggaggeggtt caggeggagg tggetetgge 420
ggtggeggat egeagtetgt gttgaegeag eegeeeteag tgtetgege eecaaggaeag 480
aaggteacea teteetgete tggaageage teeaacattg ggaataatta tgtateetgg 540
taccageage teecaaggaae ageeeceaaa eteeteatet atggteacae caateggeee 600
geaggggtee etgaeegatt etetggetee aagtetggea eegeatgga tgaeageetg 660
agtgggttee ggteegaga tgaggetgat tattaetgge cageatgga tgaeageetg 720
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125

140

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Pro Glu Tyr Phe Gln His Trp Gly Gln Gly Thr Leu Val Thr Val Ser

Ser Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Ser

120

135



<210> 36

115

130

Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Ala Ala Pro Gly Gln
145 150 155 160

Lys Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Asn Asn 165 170 175

Tyr Val Ser Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu 180 185 190

Ile Tyr Asp His Thr Asn Arg Pro Ala Gly Val Pro Asp Arg Phe Ser
195 200 205

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Phe Arg 210 215 220

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ser Trp Asp Tyr Thr Leu 225 230 235 240

Ser Gly Trp Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Ala 245 250 255

Ala Ala His His His His His Gly Gly Gly Cys
260 265

<210> 37

<211> 807

<212> DNA

<213> Artificial Sequence

<220>

<400> 37

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cccgggaaaagcctggagtacatggggctatctatcctggtgactctgacaccaatac180agcccgtccttccaaggcaggtcaccatctcagtcgacagtccgtcagcactgcctac240ttgcaatggagcagtctgaagccctcggacagcgccgtgtatttttgtgcgagacatgac300gtgggatattgcagtagttccaactgcgcaaagtggcctgaatacttccagcattggggc420cagggcaccctggtcaccgtctcctcaggtggaggcggttcaggcggaggtggctctggc420ggtggcggatcgcagtctgtgttgacgcagcccaacattgggaataattatgtatcctgg540taccagcagctcccaggaacagccccaaactcctcatctatgatcacacatcggccc600gcagggttccctgaccgattctctggctcaagtctggcctccaggaccctcggcatc720tcgggctggtgttcggcgaggaaccaagctgaccgtctaggtgcgccgcacaccat780catcaccatcacggtggtgcacggtggtgctaggtgcgccgcacaccat780
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<210> 38

<211> 282

<212> PRT

<213> Artificial Sequence

<220>

<400> 38

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu

1 5 10 15

Ser Leu Lys Ile Ser Cys Lys Gly Ser Gly Tyr Ser Phe Thr Ser Tyr
20 25 30

Trp Ile Ala Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Tyr Met
35 40 45

Gly Leu Ile Tyr Pro Gly Asp Ser Asp Thr Lys Tyr Ser Pro Ser Phe
50 55 60

Gln Gly Gln Val Thr Ile Ser Val Asp Lys Ser Val Ser Thr Ala Tyr 65 70 75 80



Leu Gln Trp Ser Ser Leu Lys Pro Ser Asp Ser Ala Val Tyr Phe Cys Ala Arg His Asp Val Gly Tyr Cys Ser Ser Ser Asn Cys Ala Lys Trp Pro Glu Tyr Phe Gln His Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Ala Ala Pro Gly Gln Lys Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Asn Asn Tyr Val Ser Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu Ile Tyr Asp His Thr Asn Arg Pro Ala Gly Val Pro Asp Arg Phe Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Phe Arg Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ser Trp Asp Tyr Thr Leu Ser Gly Trp Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Ala

Ala Ala His His His His His Gly Gly Gly Cys Leu Glu Ser

Ser Ser Ser Gly Ser Glu Lys Asp Glu Leu

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846

<210> 39 <211> 846 <212> DNA <213> Artificial Sequence <220> <223> Description of Artificial Sequence: Human/murine chimeric single chain binding polypeptide (C6ML-3-9sFv'-L1-KDEL)<400> 39 caggtgcagc tggtgcagtc tggggcagag gtgaaaaaagc ccggggagtc tctgaagatc 60 teetgtaagg gttetggata eagetttaee agetaetgga tegeetgggt gegeeagatg 120 cccgggaaag gcctggagta catggggctc atctatcctg gtgactctga caccaaatac 180 agecegteet tecaaggeea ggteaceate teagtegaea agteegteag caetgeetae 240 ttgcaatgga gcagtctgaa gccctcggac agcgccgtgt atttttgtgc gagacatgac 300 gtgggatatt gcagtagttc caactgcgca aagtggcctg aatacttcca gcattggggc 360 cagggcaccc tggtcaccgt ctcctcaggt ggaggcggtt caggcggagg tggctctggc 420 ggtggcggat cgcagtctgt gttgacgcag ccgccctcag tgtctgcggc cccaggacag 480 aaggtcacca teteetgete tggaageage tecaacattg ggaataatta tgtateetgg 540 taccagcage teccaggaae ageeceeaaa etecteatet atgateaeae caateggeee 600 gcaggggtcc ctgaccgatt ctctggctcc aagtctggca cctcagcctc cctggccatc 660 agtgggttcc ggtccgagga tgaggctgat tattactgtg cctcctggga ctacaccctc 720 tegggetggg tgtteggegg aggaaceaag etgacegtee taggtgegge egeacaceat 780 catcaccatc acggtggtgg cggctgcctc gagtcctcta gctctggatc cgaaaaagat 840

280

275

gaactg

<210> 40 <211> 287 <212> PRT

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<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Human/murine chimeric single chain binding polypeptide

(C6ML3-9sFv'-L2-KDEL)
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<400> 40

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu

1 5 10 15

Ser Leu Lys Ile Ser Cys Lys Gly Ser Gly Tyr Ser Phe Thr Ser Tyr
20 25 30

Trp Ile Ala Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Tyr Met
35 40 45

Gly Leu Ile Tyr Pro Gly Asp Ser Asp Thr Lys Tyr Ser Pro Ser Phe
50 55 60

Gln Gly Gln Val Thr Ile Ser Val Asp Lys Ser Val Ser Thr Ala Tyr
65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Pro Ser Asp Ser Ala Val Tyr Phe Cys
85 90 95

Ala Arg His Asp Val Gly Tyr Cys Ser Ser Ser Asn Cys Ala Lys Trp

100 105 110

Pro Glu Tyr Phe Gln His Trp Gly Gln Gly Thr Leu Val Thr Val Ser 115 120 125

Ser Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Ser 130 135 140

Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Ala Ala Pro Gly Gln 145 150 155 160

Lys Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Asn Asn 165 170 175

Tyr Val Ser Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu 180 185 190



Ile Tyr Asp His Thr Asn Arg Pro Ala Gly Val Pro Asp Arg Phe Ser
195 200 205

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Phe Arg 210 215 220

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ser Trp Asp Tyr Thr Leu 225 230 235 240

Ser Gly Trp Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Ala 245 250 255

Ala Ala His His His His His Gly Gly Gly Cys Leu Glu Ser
260 265 270

Ser Ser Ser Gly Ser Ser Ser Gly Ser Glu Lys Asp Glu Leu 275 280 285

<210> 41

<211> 861

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Human/murine chimeric single chain binding polypeptide (C6ML3-9sFv'-L2-KDEL)

<400> 41

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aaggtcacca tctcctgctc tggaagcagc tccaacattg ggaataatta tgtatcctgg 540 taccagcagc tcccaggaac agccccaaa ctcctcatct atgatcacac caatcggccc 600 gcaggggtcc ctgaccgatt ctctggctcc aagtctggca cctcagcctc cctggccatc 660 agtgggttcc ggtccgagga tgaggctgat tattactgtg cctcctggga ctacaccctc 720 tcgggctggg tgttcggcgg cggcaccaag ctgaccgtcc taggtgcggc cgcacaccat 780 catcaccatc acggtggtg cggctgctc gagtctagca gctccggttc ctctagctct 840 ggatccgaaa aagatgaact g

<210> 42

<211> 296

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Human/murine chimeric single chain binding polypeptide

(C6ML3-9sFv'-L2-H14)

<400> 42

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1 5 10 15

Ser Leu Lys Ile Ser Cys Lys Gly Ser Gly Tyr Ser Phe Thr Ser Tyr
20 25 30

Trp Ile Ala Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Tyr Met
35 40 45

Gly Leu Ile Tyr Pro Gly Asp Ser Asp Thr Lys Tyr Ser Pro Ser Phe
50 55 60

Gln Gly Gln Val Thr Ile Ser Val Asp Lys Ser Val Ser Thr Ala Tyr
65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Pro Ser Asp Ser Ala Val Tyr Phe Cys
85 90 95

Ala Arg His Asp Val Gly Tyr Cys Ser Ser Ser Asn Cys Ala Lys Trp
100 105 110

Pro Glu Tyr Phe Gln His Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Ala Ala Pro Gly Gln Lys Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Asn Asn Tyr Val Ser Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu Ile Tyr Asp His Thr Asn Arg Pro Ala Gly Val Pro Asp Arg Phe Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Phe Arg Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ser Trp Asp Tyr Thr Leu Ser Gly Trp Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Ala Ala Ala His His His His His Gly Gly Gly Cys Leu Glu Ser

Ser Ser Ser Gly Ser Ser Ser Gly Ser Lys Lys Ser Ala Lys Lys

B2 Cod

Thr Pro Lys Lys Ala Lys Lys Pro

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<210> 43
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<212> DNA
<213> Artificial Sequence
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<223> Description of Artificial Sequence: Human/murine
      chimeric single chain binding polypeptide
      (C6ML3-9sFv'-L2-H14)
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cccgggaaag gcctggagta catggggctc atctatcctg gtgactctga caccaaatac 180
agcccgtcct tccaaggcca ggtcaccatc tcagtcgaca agtccgtcag cactgcctac 240
ttgcaatgga gcagtctgaa gccctcggac agcgccgtgt atttttgtgc gagacatgac 300
gtgggatatt gcagtagtte caactgegea aagtggeetg aataetteea geattgggge 360
cagggcaccc tggtcaccgt ctcctcaggt ggaggcggtt caggcggagg tggctctggc 420
ggtggcggat cgcagtctgt gttgacgcag ccgccctcag tgtctgcggc cccaggacag 480
aaggtcacca tctcctgctc tggaagcagc tccaacattg ggaataatta tgtatcctgg 540
taccagcage teccaggaae ageececaaa etecteatet atgateacae caateggeee 600
gcaggggtcc ctgaccgatt ctctggctcc aagtctggca cctcagcctc cctggccatc 660
agtgggttcc ggtccgagga tgaggctgat tattactgtg cctcctggga ctacaccctc 720
tegggetggg tgtteggegg aggaaceaag etgaeegtee taggtgegge egeaeaeeat 780
catcaccatc acggtggtgg cggctgcctc gagtctagca gctccggttc ctctagctct 840
ggatccaaga aaagcgcgaa aaagaccccg aagaaagcga agaaaccg
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<210> 44
<211> 291
<212> PRT
<213> Artificial Sequence
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<223> Description of Artificial Sequence: Human/murine
      chimeric single chain binding polypeptide
      (C6ML3-9sFv'-L2-nls)
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<400> 44

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Trp	Ile	Ala 35	Trp	Val	Arg	Gln	Met 40	Pro	Gly	Lys	Gly	Leu 45	Glu	Tyr	Met
Gly	Leu 50	Ile	Tyr	Pro	Gly	Asp 55	Ser	Asp	Thr	Lys	Tyr 60	Ser	Pro	Ser	Phe
Gln 65	Gly	Gln	Val	Thr	Ile 70	Ser	Val	Asp	Lys	Ser 75	Val	Ser	Thr	Ala	Туг 80
Leu	Gln	Trp	Ser	Ser 85	Leu	Lys	Pro	Ser	Asp 90	Ser	Ala	Val	Tyr	Phe 95	Cys
Ala	Arg	His	Asp 100	Val	Gly	Tyr	Cys	Ser 105	Ser	Ser	Asn	Cys	Ala 110	Lys	Trp
Pro	Glu	Tyr 115	Phe	Gln	His	Trp	Gly 120	Gln	Gly	Thr	Leu	Val 125	Thr	Val	Ser
Ser	Gly 130	Gly	Gly	Gly	Ser	Gly 135	Gly	Gly	Gly	Ser	Gly 140	Gly	Gly	Gly	Ser
Gln 145	Ser	Val	Leu	Thr	Gln 150	Pro	Pro	Ser	Val	Ser 155	Ala	Ala	Pro	Gly	Gln 160
Lys	Val	Thr	Ile	Ser 165	Cys	Ser	Gly	Ser	Ser 170	Ser	Asn	Ile	Gly	Asn 175	Asn
Tyr	Val	Ser	Trp 180	Tyr	Gln	Gln	Leu	Pro 185	Gly	Thr	Ala	Pro	Lys 190	Leu	Leu
Ile	Tyr	Asp	His	Thr	Asn	Arg	Pro	Ala	Gly	Val	Pro	Asp	Arg	Phe	Ser

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Phe Arg 210 215 220

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ser Trp Asp Tyr Thr Leu 225 230 235 240

Ser Gly Trp Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Ala 245 250 255

Ala Ala His His His His His Gly Gly Gly Cys Leu Glu Ser
260 265 270

Ser Ser Ser Gly Ser Ser Ser Gly Ser Thr Pro Pro Lys Lys Lys 275 280 285

Arg Lys Val 290

<210> 45

<211> 873

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Human/murine chimeric single chain binding polypeptide

(C6ML3-9sFv'-L2-nls)

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Gly Gly Gly Ser
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Br. Cross